

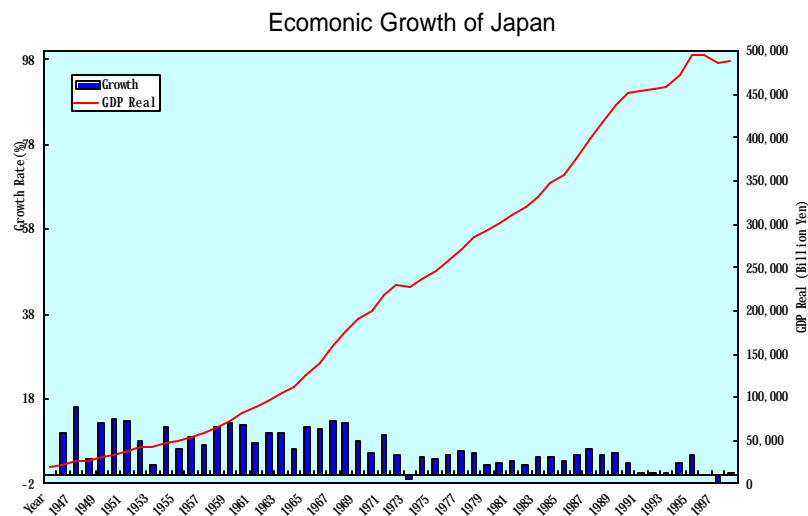
# Reformation of Government R&D for Promoting Innovation in Japan

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March 11, 2003

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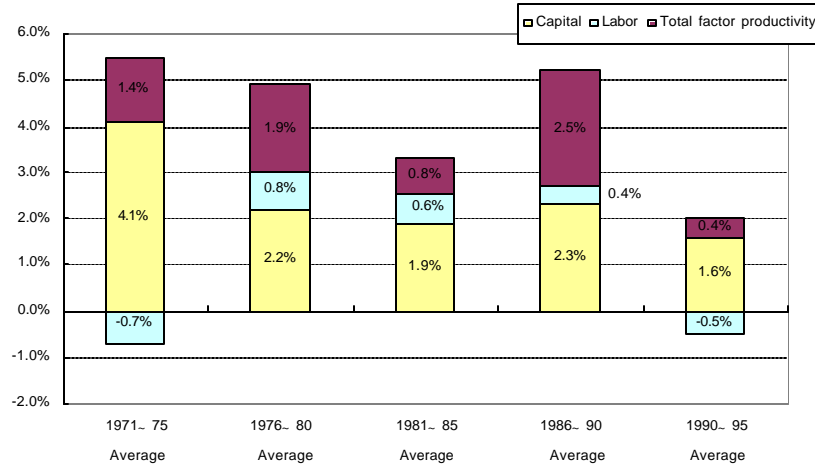
## Economic Growth of Japan



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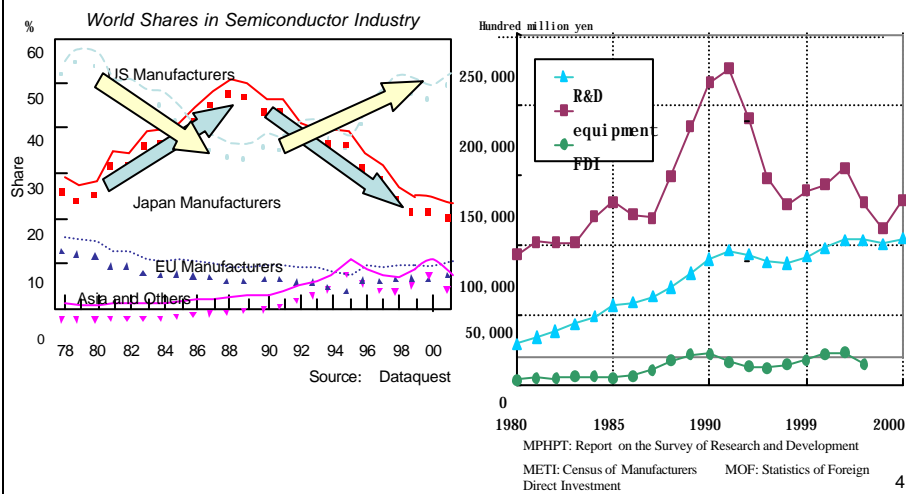
# The Role of Technology

*The Role of Technological Innovation in Economic Growth*



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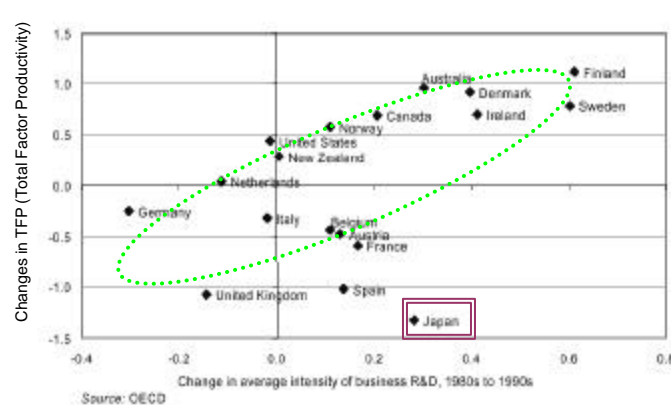
# The Japanese Economy in the 1990s



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## The Gap between R&D and Economic Growth

Changes in TFP and in average intensity of business R&D (1980s to 1990s)



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## History of Industrial Technology Policy

- **50's: Social and Economic Recovery**
  - Development of fundamental industries for economic reconstruction.
  - Strategic technology introduction, funds for technological developments.
- **60's: Rapid Growth**
  - The vision of the 60's: self-development, advanced nation.
  - Larger scale projects, critical technology R&D funding.
- **70's: Diversification**
  - "Intellectual" industry, deal with environmental problems.
  - New energy & energy efficiency technology. VLSI collaborative R&D.
- **80's: Building of a Technology Nation**
  - R&D for Future generation industrial infrastructure.

### **90's: International contribution –strengthen industry competitiveness**

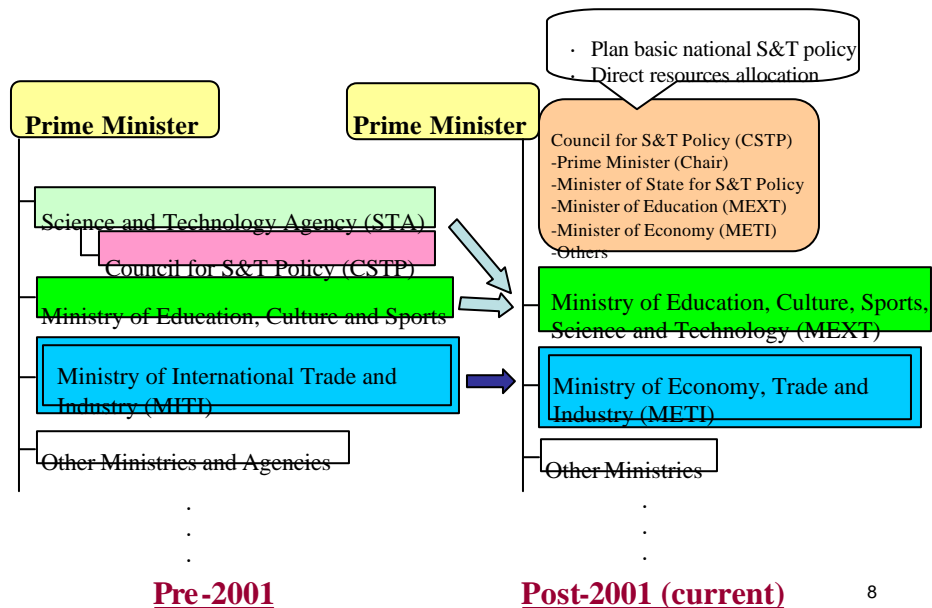
- Globalization of technology policies to improve competitiveness
- R&D priority, innovation involving both science and business.

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## Recent Progress of Japanese S&T Policy

- June 1995 Law for Enhancement of Science and Technology  
**Science and Technology Basic Plan( I; 1996-2000)**
- July 1997 Introduction of Evaluation Scheme for R&D  
“Innovation Research Group” (MITI)
- May 1998 **Law for Technology Licensing Office**
- Aug 1999 **Japanese “ Bahy-Dole” Provision**
- Dec 1999 **Japanese “ SBIR” Program**
- Apr 2000 *National Industry Technology Strategy (P-A-G)*  
Industrial Technology Enhancement Law
- June 2000 *WG on Industry Technology for S&T Basic Plan*
- Jan 2001 Government Reformation
- Mar 2001 **Science and Technology Basic Plan( II;2001-2005)** <sup>7</sup>

## Organizational Reform of S&T Policy (Jan., 2001)



## Science and Technology Basic Plan (March 2001 by CSTP)

- Basic Concept

“S&T is the driving force of sustainable development and for pioneering the future of humanity.”

- Goals as a Nation through S&T

- International contribution through knowledge
- Global level competitiveness and sustainable development
- Nation providing security and high quality of life

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## Science and Technology Basic Plan (cont.)

1. Government R&D Investment    ¥24T (\$200B)    FY2001-2005

2. Strategic Prioritization of R&D

- Basic Science
- 4 areas: Life Science; Information and Telecommunication; Environment; Nanotechnology and Material.

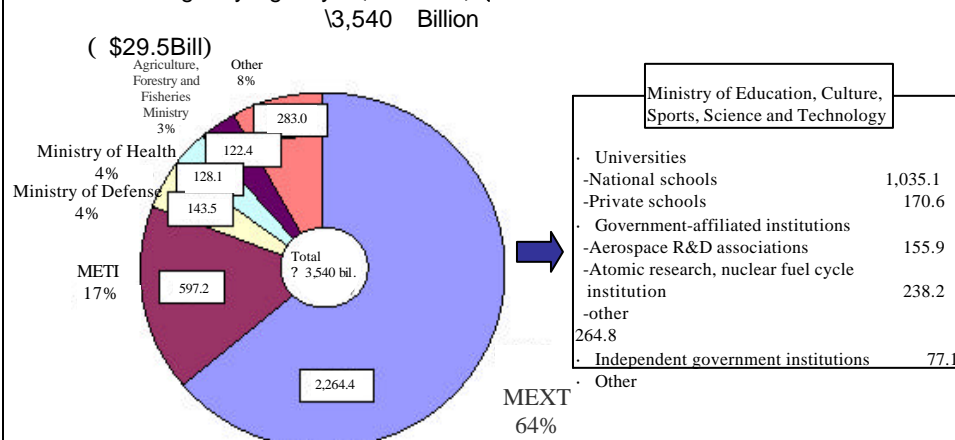
3. S&T System Reformation

- Expansion of Competitive Research Fund
  - Doubling the size of solicitation-type grant and introduction of overhead cost
- Mobilization of Human Resources
  - Introduction of tenure system for national laboratories
- Support for the Industrial Technology
  - Enhancement of Government-University-Industry Partnership
- Reformation of National Universities
  - Development of independent administration

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## Roles of the METI in Science & Technology Policy

S&T Budget by Agency (FY2002)



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## What is NEDO?

### New Energy and Industrial Technology Development Organization

#### **HISTORY:**

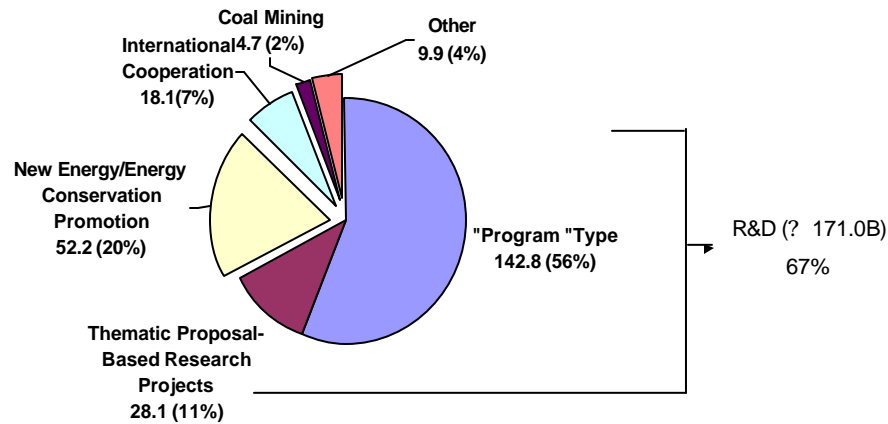
- October 1980 Established as New Energy Development Organization  
Funding organization/Affiliation with MITI
- October 1988 Added industrial technology R&D  
(New Energy and Industrial Technology Development Organization)
- October 2003 Re-established as an independent administrative institution

**BUDGET:** 256 Billion Yen (FY 2003) (\$2.1Billion)

**STAFF:** 774 (As of July 1, 2002)

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## NEDO Budget Outline: ¥255.8B ( FY 2003) ( \$2.1Billion)



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## Overview of Competitive Grant “ Teian-Kobo” System

- Established in 1995 by METI
- Objective
  - To foster R&D activities which are considered highly promising and innovative as the “seeds” for future industrial technology.
- Modeled after the US competitive grant system
  - (e.g., solicitation, peer-review system)
- Other ministries also introduced competitive grant systems

¥170Billion('96) ? 294( '01) ? 349('03)? ? 600('05)

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## Various Mechanisms of Support of Competitive Grant System



Research grant for young researchers



High-risk, pre-competitive industrial R&D assistance



International collaborative research projects in energy/environmental fields

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## “Industrial Technology Development Support Program”; Support for Pre-competitive R&D

- “Industrial Technology Development Support Program”
- Similar to ATP
- Assist private sector to perform pre-competitive, high-risk R&D which would lead to new industry creation and solutions for social issues.
- Budget and number of projects:

	Budget (in Yen)	Number of Applications	Awards
<b>FY1998</b>	4.2 billion	93	40
<b>FY1999</b>	3.5 billion	154	36
<b>FY2000</b>	3.1 billion	183	34
<b>FY2001</b>	4.8 billion	185	38
<b>FY2002</b>	4.5 billion	100	35

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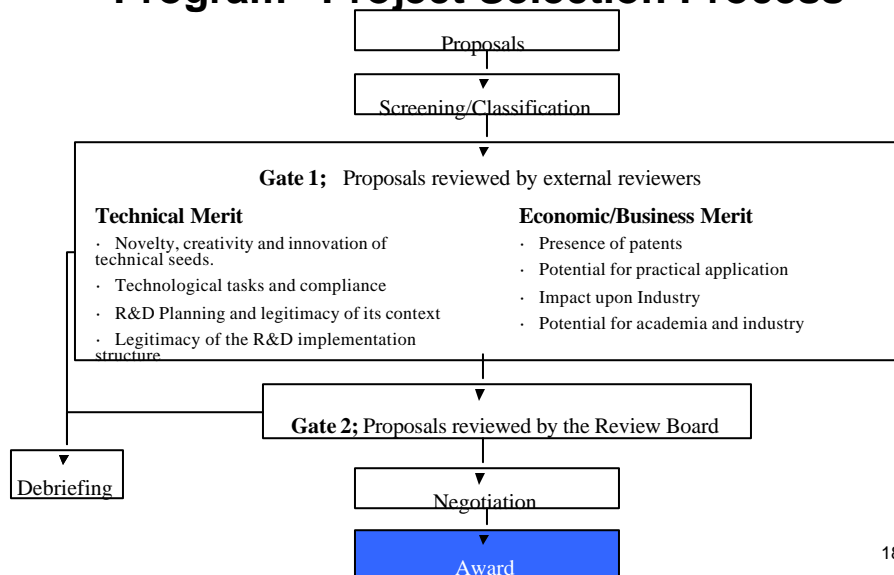


## “Industrial Technology Development Support Program”

- Cost-sharing:
  - Private companies >50%
  - Spin-off institutions from universities and research institutions >1/3
- Project period: 2 years
- Technology fields:
  - Life science, IT, environment, nanotechnology, energy, manufacturing, social infrastructure, cutting-edge technology
- Eligible cost:
  - Equipment, construction, supplies and material, engineering and design cost, salary, etc.

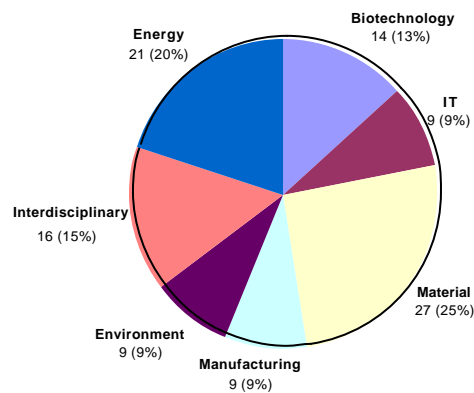
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## “Industrial Technology Development Support Program” Project Selection Process



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## “ Industrial Technology Development Support Program” Portfolio (FY2002)



Total Projects in 2002: 105

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## Promoting Strategic R&D through “Program”

### [Program]

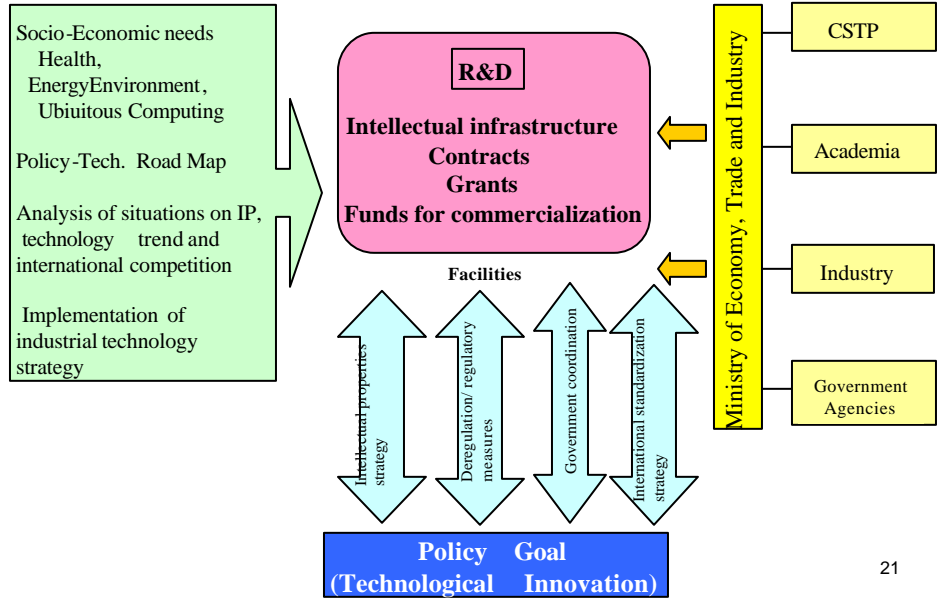
- A program is a comprehensive package of policy measures, such as R&D, establishment of techno infrastructure, code and standard setting to accomplish a policy goal mainly by the technological breakthroughs.
- It includes coordination and organization of similar R&D under the same policy goals, as well as collaborating multiple R&Ds.

### [Purpose]

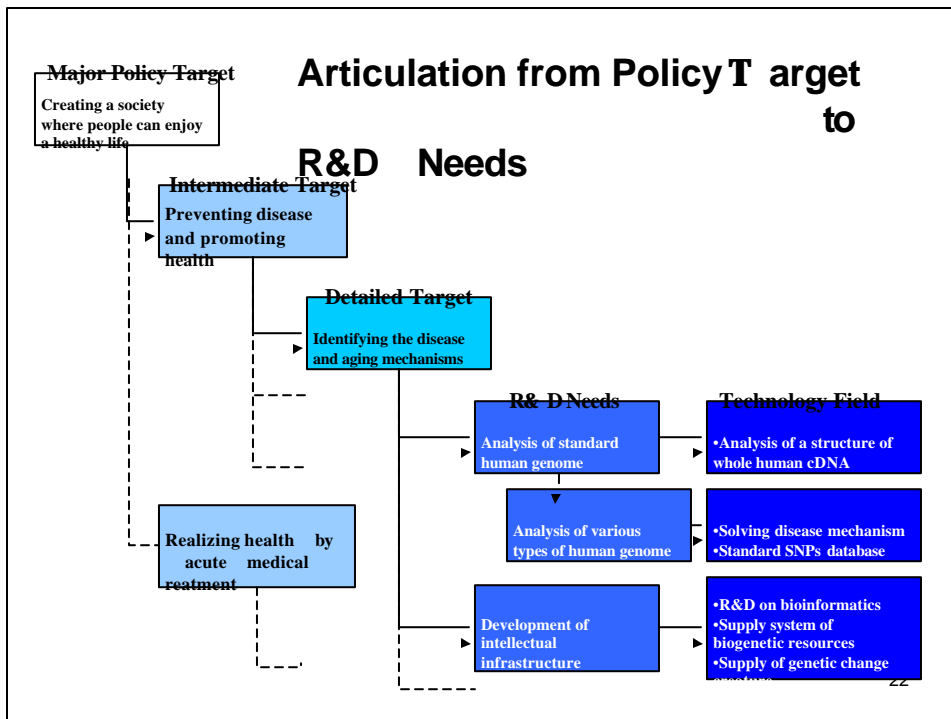
- Improve performance of government R&D investment and accountability  
Avoid duplicate or unnecessary investment
- Clarify the role of government for challenging a socio-economic problem
- Common understanding for the future goal  
Policy – Technology road mapping  
Attract R&D investment from the private sector

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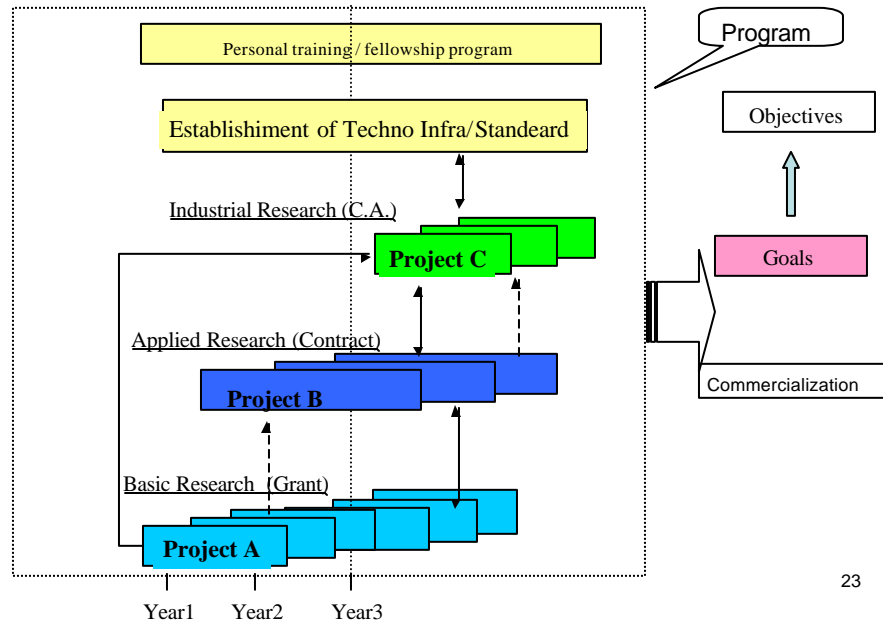
## Program Structure



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## Structure of the Program



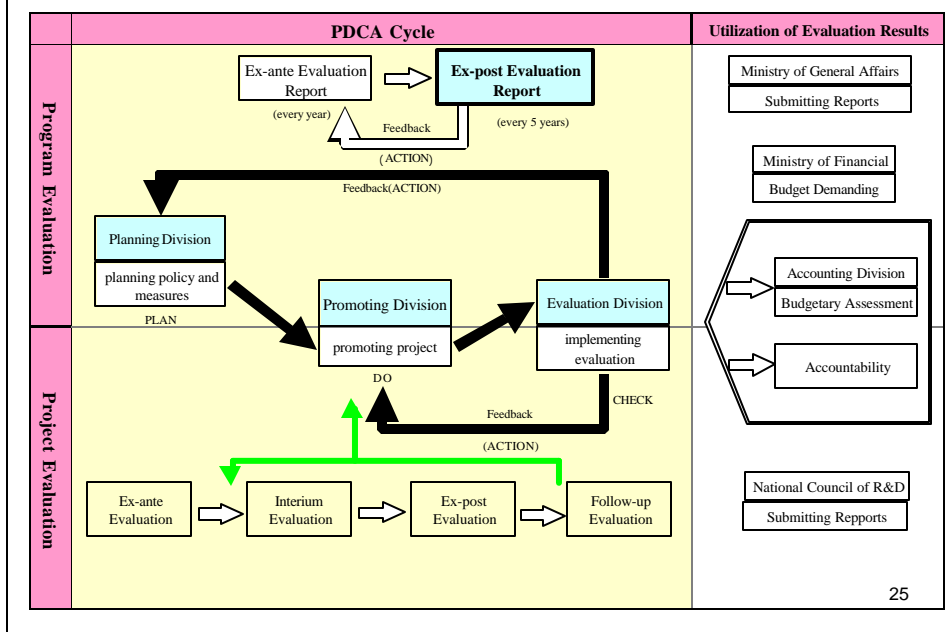
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## Types and Methods of R&D Within “Programs”

	Recipient	Term, Scale	Selection Process	Evaluation	Objective
<b>Project Type</b> (Contract R&D)	Consortia	Up to 5 yrs	Request for Proposal/ Selection Committee	-Ex-ante -Interview -Ex-post -Follow-up	Pre-Competitive Long-term (Extremely High risk, Large scale)
<b>Cooperative Agreement Type</b> (Theme-given, Re-coupment)	Individual Company	Up to 2 (+1) yrs ? 100M/year Cost Share 50% Corporations 67% S&M	Teian-Kobo/ Merit-Review	-Ex-post -Follow-up	Pre-competitive Mid-term (Could be commercialized within several years)
<b>Basic Research</b> (Grant)	Universities Research Institutes	Up to 2 (+1) yrs ? 30M/year Grant (100%)	Teian-Kobo Merit-Review	-Ex-post	Basic Research (Individual ideas)

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## Program and Project Evaluation



## R&D Programs in FY 2003 (¥129.4B)

### [Life Science] ¥19.3B

- Fundamental Biotechnology Research Program for Promotion and Maintenance of Health (¥12.11B)
- Biological Function Application Cyclical Industry System Creation Program (¥4.12B)
- Program for Development and Advancement of Medical Treatment Equipment for the Extension of Life and Health (¥1.89B)

### [IT] ¥43.0B

- Next Generation Semiconductor Devices and Processes Technology (MIRAI) program (¥14.63B)
- Program to Advance Information and Telecommunication Infrastructure (¥5.30B)
- Promotion of Software Development in Information Telecommunication Infrastructure Program (¥1.00B)
- Next Generation Display Technology Development Program (¥2.21B)
- 21st Century Robot Challenge Program (¥0.09B)
- New Production Technology Program (¥2.38B)
- Program for the Advancement of Space Industries (¥7.82)

### [Nanotechnology Materials] ¥12.4B

- Nanotechnology Program (¥7.12)
- Program for Generating Innovative Materials Industries (¥5.24)

### [Environment] ¥54.8B

- Comprehensive Program for Chemical substance evaluation and management ¥2.01B
- 3R program (¥1.54B)
- Innovative Global Warming Countermeasure Technology Program (¥10.12B)
- Solid Macromolecule Fuel Battery/Hydrogen Energy Utilization Program (¥15.95B)
- Energy Environment Carbon Dioxide Solidification/Effective Utilization Program (¥0.88B)
- Next Generation Low -Emission Automobile Technology Development Program (¥2.13B)
- Private Sector Aircraft Fundamental Technology Program (¥4.65B)

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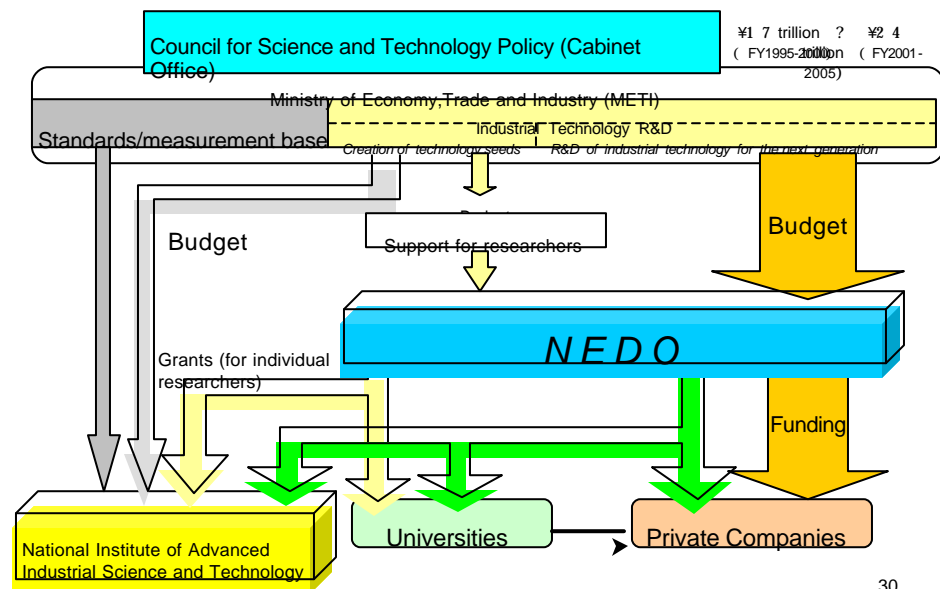
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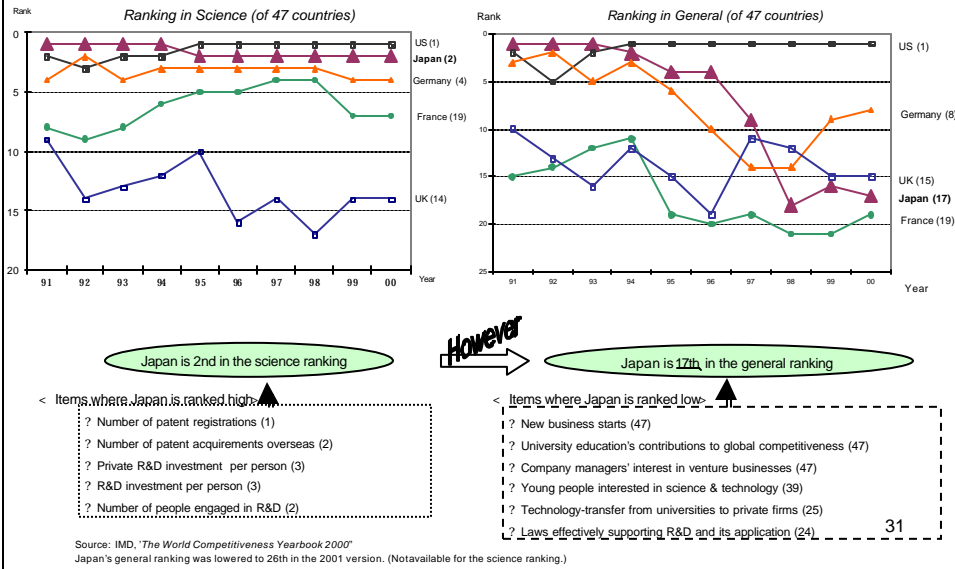
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## NEDO's Role in R&D



## The Gap between Technological Potential and Competitiveness



## R&D Funding by the Government

